

EXHIBIT 42

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UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA
SAN JOSE DIVISION

CISCO SYSTEMS, INC.,)
)
Plaintiff,)
) Case No.
vs.) 5:14-cv-05344-BLF (PSG)
)
ARISTA NETWORKS, INC.,)
)
Defendant.)
_____)

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VIDEOTAPED DEPOSITION OF KIRK LOUGHEED
Palo Alto, California
Friday, November 20, 2015
Volume I

Reported by:
CARLA SOARES
CSR No. 5908
Job No. 2187110
Pages 1 - 189

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<p>1 UNITED STATES DISTRICT COURT 2 NORTHERN DISTRICT OF CALIFORNIA 3 SAN JOSE DIVISION 4 5 CISCO SYSTEMS, INC.,) 6) 7 Plaintiff,) 8) Case No. 9 vs.) 5:14-cv-05344-BLF (PSG) 10) 11 ARISTA NETWORKS, INC.,) 12) 13 Defendant.) 14 _____) 15 16 17 18 19 20 21 22 23 24 25</p> <p>VIDEOTAPED DEPOSITION OF KIRK LOUGHEED, Volume I, taken on behalf of Defendant, at 650 Page Mill Road, Palo Alto, California, beginning at 9:19 a.m., and ending at 6:15 p.m., on Friday, November 20, 2015, before CARLA SOARES, Certified Shorthand Reporter No. 5908.</p>	<p>1 APPEARANCES (Continued): 2 3 For the Defendant: 4 KEKER & VAN NEST LLP 5 BY: BRIAN L. FERRALL, Attorney at Law 6 BY: RYAN WONG, Attorney at Law 7 633 Battery Street 8 San Francisco, California 94111 9 415.391.5400 10 bferrall@kvn.com 11 rwong@kvn.com 12 13 ALSO PRESENT: Sean Grant, Video Operator 14 --o0o-- 15 16 17 18 19 20 21 22 23 24 25</p>
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<p>1 APPEARANCES: 2 3 For the Plaintiff and the Witness: 4 QUINN EMANUEL URQUHART & SULLIVAN, LLP 5 BY: JOHN (JAY) NEUKOM, Attorney at Law 6 50 California Street, 22nd Floor 7 San Francisco, California 94111 8 415.875.6341 9 johnneukom@quinnemanuel.com 10 and 11 KIRKLAND & ELLIS LLP 12 BY: JOSHUA L. SIMMONS, Attorney at Law 13 601 Lexington Avenue 14 New York, New York 10022 15 212-446-4989 16 joshua.simmons@kirkland.com 17 18 19 20 21 22 23 24 25</p>	<p>1 INDEX 2 WITNESS 3 KIRK LOUGHEED EXAMINATION 4 Volume I 5 BY MR. FERRALL 10 6 7 EXHIBITS 8 NUMBER DESCRIPTION PAGE 9 Exhibit 29 Document headed "Internet 73 10 Protocol," 11 Bates ARISTANDCA0031553 - 1601 12 13 Exhibit 30 Document headed "DoD Internet 73 14 Host Table Specification" 15 16 Exhibit 31 Document headed "An Ethernet 73 17 Address Resolution Protocol or 18 Converting Network Protocol 19 Addresses to 48.bit Ethernet 20 Address for Transmission on 21 Ethernet Hardware," 22 Bates ARISTANDCA0003130 - 1639 23 24 25</p>
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1	EXHIBITS		
2	NUMBER	DESCRIPTION	PAGE
3	Exhibit 32	Document headed "Address	85
4		Resolution Protocol (ARP) module	
5		for the Yeager gateway"	
6			
7	Exhibit 33	Email string, top email to Kirk	89
8		Lougheed and Paula Lablauer from	
9		Mike Sanchez, dated 11-17-14,	
10		Bates CSI-CLI-01326834 - 6837	
11			
12	Exhibit 34	Email string, top email to Phillip	93
13		Remaker from Kirk Lougheed, dated	
14		3-30-10, Bates CSI-CLI-01317865 -	
15		7866	
16			
17	Exhibit 35	Email string, top email to Joe	100
18		Hielscher from Kirk Lougheed,	
19		dated 7-23-08,	
20		Bates CSI-CLI-01134849 - 4850	
21			
22	Exhibit 36	Document entitled "Stanford	101
23		Ethertip/Gateway User and	
24		Configuration Guide,"	
25		Bates CSI-CLI-01315523 - 5568	
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1	EXHIBITS		
2	NUMBER	DESCRIPTION	PAGE
3	Exhibit 43	Document entitled "DECrouter 90	181
4		Products," Bates CSI-ANI-00081683 -	
5		1683.000344	
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1	EXHIBITS		
2	NUMBER	DESCRIPTION	PAGE
3	Exhibit 37	Document entitled "cisco Systems	106
4		AGS User Manual,"	
5		Bates CSI-CLI-00358166 - 8223	
6			
7	Exhibit 38	Email string, top email to Phillip	122
8		Remaker from Kirk Lougheed, dated	
9		12-11-08, Bates CSI-ANI-00043306 -	
10		3306.000001	
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12	Exhibit 39	Document entitled "Cisco's	152
13		Response to Arista's Interrogatory	
14		No. 16 Amended Exhibit D1 (IOS	
15		Release 11.0)"	
16			
17	Exhibit 40	Email to Craig Fox from Kirk	160
18		Lougheed, dated 3-6-96,	
19		Bates CSI-CLI-00746398	
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21	Exhibit 41	Document described as source	162
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17	Exhibit 40		

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1 A Could you explain to me what you mean by 11:09:26	1 [REDACTED] 11:14:51
2 "parser"?	1 Q [REDACTED]
3 Q Do you know what a parser is?	[REDACTED]
4 A I know in a generic sense what a parser	1 [REDACTED]
5 is. 11:09:45	1 Q [REDACTED]
6 Q What's a parser in your -- based on your	[REDACTED]
7 understanding?	[REDACTED]
8 A A parser is something that takes a string	1 [REDACTED]
9 of text and divides it up into a sequence of tokens,	[REDACTED]
10 and then takes some action based on those sequence [REDACTED]	1 Q [REDACTED]
11 of tokens.	[REDACTED]
12 Q Based upon that understanding, do you know	1 [REDACTED] p [REDACTED]
13 whether EXEC had a parser?	[REDACTED]
14 A Yes.	1 Q [REDACTED]
15 Q It did? 11:10:25	1 [REDACTED]
16 A It did.	1 Q [REDACTED]
17 Q How do you know that it had a parser?	[REDACTED]
18 A Because it had the behavior that I	1 [REDACTED]
19 described.	19 Q Are you familiar with the syntax of
20 Q Had you ever seen the EXEC source code? [REDACTED]	20 TOPS-20 commands? 11:17:00
21 A Yes.	21 A In a -- yes.
22 Q And had you seen the parser code of EXEC?	22 Q Can you explain what it is?
23 A I had seen parts of it.	23 A There are many commands. I do not
24 Q How did you come to see that code?	24 remember all of them.
25 A It was -- Stanford had a source license to 11:11:33 [REDACTED]	25 Q Was there a general format for TOPS-20 11:17:37
	Page 56
1 that software. 11:11:38	1 commands, to your recollection? 11:17:42
1 [REDACTED]	2 A Yes.
1 [REDACTED]	3 Q What was that format?
1 [REDACTED]	4 A Again, there are many commands, and I
1 [REDACTED]	5 don't remember all the details of those commands. 11:18:10
1 [REDACTED]	6 Q Okay. Do you -- I was trying to get
1 Q [REDACTED]	7 beyond that by asking you a general question about
[REDACTED]	8 the format that might be applicable to a range of
1 [REDACTED]	9 commands.
1 Q [REDACTED]	10 Is there such a thing, to your knowledge? 11:18:27
[REDACTED]	11 MR. NEUKOM: Objection to form. Vague.
1 [REDACTED] p [REDACTED]	12 THE WITNESS: The -- the EXEC -- the
[REDACTED]	13 number of such commands was large and varied. And
1 Q [REDACTED]	14 DEC appeared to have a standard way of doing things,
[REDACTED]	15 but I don't remember all the details. 11:18:55
1 [REDACTED]	16 BY MR. FERRALL:
1 [REDACTED]	17 Q Okay. Can you tell me anything you
1 [REDACTED]	18 remember about the way TOPS-20 commands were
1 [REDACTED]	19 formatted as a general matter?
[REDACTED] 11:14:29	20 MR. NEUKOM: Objection to form. 11:19:20
1 [REDACTED] p [REDACTED]	21 THE WITNESS: There would be a leading
1 [REDACTED]	22 keyword, perhaps one or two leading keywords. There
1 [REDACTED]	23 was -- to help people along, you could hit an
1 [REDACTED]	24 "escape" key. You would complete -- it might print
[REDACTED] 11:14:49	25 out something called a guide word. 11:20:05
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1 software prior to receiving a copy of it from 11:31:52	1 Q Okay. So you weren't responsible for the 11:35:54
2 Mr. Yeager?	2 terminal server software as part of your duties at
3 A The software that I was interested in was	3 Stanford, were you?
4 the terminal server software, which...	4 A I was not responsible for the terminal
5 Q And why did you know about it? 11:32:18	5 server software as part of my official duties. 11:36:27
6 A Stanford had a number of terminal servers	6 Q Okay. So you requested the software from
7 on its network, and we used them.	7 Mr. Yeager out of interest, is that fair?
8 Q Can you tell me what you -- what is a	8 A Yes.
9 terminal server?	9 Q And do you know approximately when you
10 A It is a device for concentrating character 11:32:47	10 made that request to Mr. Yeager for the software? 11:36:44
11 mode terminals onto a network, and using a network	11 A To the best of my recollection, it was
12 protocol to exchange characters back and forth	12 early 1985. It could have been late 1984, though.
13 between the terminal server and the networked	13 Q Do you know who wrote the software that
14 computer at the other end.	14 Mr. Yeager provided to you?
15 Q Did the software that Mr. Yeager provided 11:33:17	15 A I do not know -- I do not know who wrote 11:37:43
16 to you, did it have a name at the time?	16 the software.
17 A Not that I recall.	17 Q Do you know anyone who contributed to that
18 Q And was that software actually in use at	18 software?
19 the time that you received a copy of it?	19 A I believe Mr. Yeager was one of the people
20 A That was my understanding. 11:33:40	20 that contributed to that software. 11:37:58
21 Q That it was in use?	21 Q Do you know anyone else who contributed to
22 A Yes.	22 it?
23 Q Where was it in use?	23 A Not with any certainty.
24 A In terminal servers on the Stanford	24 Q Who is Benji Levy?
25 network. 11:33:51	25 A He was an undergraduate at Stanford. 11:38:29
Page 62	Page 64
1 Q And would this software -- let's say the 11:33:54	1 Q While you were there? 11:38:34
2 terminal server part of it at least, was that	2 A Yes.
3 running on the -- for example, the DECSYSTEM-20	3 Q Did you ever work with Mr. Levy?
4 computers?	4 A Yes.
5 A No. 11:34:09	5 Q In what capacity? 11:38:48
6 Q What was it running on?	6 A I hired him.
7 A It was running on a SUN processor card	7 Q At Cisco?
8 where -- well, a SUN processor card.	8 A Yes. At Stanford.
9 Q The SUN processor card was not a -- itself	9 Q Oh. In what role did you hire him? Or
10 a Sun computer, known as a Sun computer yet? 11:34:52	10 what position did you hire him for, to be clear? 11:39:26
11 A It was not known -- it was -- could you	11 A We referred to it as a cable -- a cable
12 rephrase the question?	12 troll. Hardware technician would probably be the
13 Q Sure.	13 more modern description of that.
14 Well, SUN -- SUN is -- you're referring to	14 Q Did he work at all on modifying the
15 Sun Microsystems? 11:35:14	15 software that Mr. Yeager provided to you? 11:40:21
16 A No.	16 A Not to my direct knowledge. Software was
17 Q What does -- what's the SUN processor card	17 not part of his job duties for me.
18 then?	18 Q And to be clear, did Mr. Almquist work on
19 A Stanford University network.	19 modifying any of that software that Mr. Yeager
20 Q Okay. And did that -- do you understand 11:35:24	20 provided to you? 11:40:55
21 that that SUN became the Sun of Sun Microsystems?	21 A He may have.
22 A That is my understanding.	22 Q To your knowledge, did he?
23 Q Had Sun Microsystems come into existence	23 A I have no direct knowledge of that.
24 at this time?	24 Q Were you asked to make any changes to the
25 A I don't recall the dates. 11:35:53	25 software that Mr. Yeager provided to you? 11:41:13
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1 A No. That was not part of my duties. 11:41:16	1 to Stanford. 11:45:55
2 Q Did you talk to anyone about what you were	2 Q And that's what you had done your
3 going to do with that software before doing it?	3 modifications on?
4 A I may have.	4 A Yep.
5 Q Who did you talk to? 11:41:38	5 Q Did you make any modifications to the 11:46:12
6 A I don't remember if I talked to anybody	6 router functionality of the Yeager software?
7 before I started on that.	7 A My initial interest was only in the --
8 Q And what prompted you to start modifying	8 only in the terminal server software.
9 or changing that software?	9 Q So is that -- I'm sorry. Is that a no,
10 A I wanted to learn a new technology, and I 11:42:39	10 you didn't make any modifications to the router 11:46:43
11 wanted to see if I could improve the behavior of the	11 functionality?
12 terminal server.	12 A I removed it.
13 Q What was your intention of what you would	13 Q You removed it from your copy or -- what
14 do with the -- with your modifications to the	14 do you mean, you removed it?
15 software? 11:43:04	15 A That is correct. I removed it from my 11:46:58
16 A That I would be able to improve its	16 copy.
17 performance and its manageability.	17 Q So again, going back to your testimony
18 Q Sticking with the terminal server	18 earlier this morning, when you referred to extending
19 functionality, did you improve its performance?	19 and making improvements on software you received
20 A Yes, I did. 11:43:44	20 from Mr. Yeager, was that only as to the terminal 11:47:49
21 Q And did you provide your modifications	21 server functionality?
22 back to Mr. Yeager?	22 A That was my initial intent.
23 A I don't recall if I -- I don't recall if I	23 Q Okay. My question was asking about what
24 did or not.	24 you did as opposed to your intent
25 Q Did you provide those to anyone at 11:44:13	25 Did you only extend and/or make 11:48:13
Page 66	Page 68
1 Stanford? 11:44:15	1 improvements to the terminal server part of the 11:48:18
2 A I don't remember if I provided the source	2 software Mr. Yeager provided you?
3 back. I certainly provided copies of the improved	3 MR. NEUKOM: Objection to form. Vague,
4 software.	4 compound.
5 Q You mean perhaps in binary form? 11:44:34	5 THE WITNESS: At a later date I did write 11:48:39
6 A In binary form.	6 router support and put it into the software.
7 Q Why didn't you -- sorry. Strike that.	7 BY MR. FERRALL:
8 The software you received from Mr. Yeager	8 Q Okay. First, what's router support?
9 was in source?	9 A Being able to receive a packet on one
10 A Correct. 11:44:44	10 interface and figure out which of -- which other 11:49:28
11 Q Why didn't you provide the source back to	11 interface to send it out upon, rewriting the header
12 Stanford?	12 of the packet as appropriate.
13 MR. NEUKOM: Objection. Misstates prior	13 Q What was the -- strike that.
14 testimony.	14 Was there router support functionality in
15 THE WITNESS: I don't recall if I provided 11:45:02	15 the software Mr. Yeager provided you? 11:50:00
16 the source code back to anybody at Stanford. I was	16 A Yes.
17 Stanford.	17 Q And what did you do to change that?
18 BY MR. FERRALL:	18 A I removed his support because I wasn't
19 Q Did you implement the improved terminal	19 interested in it at the time, and later on -- later
20 server software at Stanford? 11:45:22	20 on my interest changed. 11:50:45
21 A Yes.	21 Q Okay. I understand that.
22 Q So where did the source for that improved	22 So what happened later on when your
23 terminal server software reside when you implemented	23 interest -- your interest then moved to the router
24 it?	24 functionality? What did you do?
25 A On a UNIX system that was -- that belonged 11:45:46	25 A I wrote support for IP, and I took a few 11:51:10
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1 pieces of the PUP support that Mr. Yeager had there. 11:51:28	1 programming techniques, possibly where the stuff 11:57:53
2 Well, actually, the PUP support actually	2 could be -- what stuff would be useful to Stanford
3 already existed for the terminal server portion.	3 that would also be interesting for me.
4 Q So the terminal server portion already had	4 Q At what time did you first have the idea
5 PUP support for routing? 11:52:08	5 to use this software in your own commercial venture? 11:58:34
6 A For routing and for terminal sessions.	6 MR. NEUKOM: Objection to form.
7 Q Okay. And did the software from	7 THE WITNESS: I did not come up with that
8 Mr. Yeager have any routing support for IP?	8 idea.
9 A Yes.	9 BY MR. FERRALL:
10 Q And did you use any of that? 11:52:46	10 Q Who did? 11:58:54
11 A No.	11 A I believe it was Len.
12 Q What did you do with it?	12 Q And when did you first learn of Len
13 A It was a confusing mess. I threw it out	13 Bosack's idea to use this software that you were
14 and wrote my own.	14 working on?
15 Q And when did you write that routing 11:53:03	15 A Sometime in early '86. 11:59:32
16 support for IP?	16 Q Did you ever tell Mr. Hanson about that
17 A Late '85, I believe.	17 idea to use the software in a commercial venture?
18 Q You wrote that -- the code -- sorry.	18 A No.
19 When you wrote that, the code was on this	19 Q Did you tell anyone at Stanford about that
20 UNIX computer at Stanford; is that right? 11:53:51	20 idea other than Mr. Bosack? 11:59:56
21 A I did my development on a UNIX system at	21 A No.
22 Stanford.	22 Q Who is Eric Schoen, S-C-H-O-E-N?
23 Q Did you talk to anyone about your	23 A I don't know.
24 intentions in writing this IP routing support prior	24 Q Do you know a Frank Gilmurray?
25 to doing so? 11:54:41	25 A Vaguely. 12:00:25
Page 70	Page 72
1 A No. 11:54:43	1 Q Do you know -- 12:00:28
2 Q Why did you do it?	2 A I recognize the name.
3 A I had figured out terminal servers and	3 Q You can't pin what he did in terms of your
4 PUP. The Internet protocol was the -- was the new	4 time at Stanford?
5 developing technology, and I wanted to learn more 11:55:07	5 A I -- my recollection is that he was a 12:00:45
6 about how IP worked.	6 systems programmer or some sort of software person
7 Q What resources did you look at to learn	7 or manager I believe in one of the other projects.
8 about how IP worked?	8 I don't know whether it was AIM or SUMEX.
9 A I looked at RFCs.	9 MR. FERRALL: Okay. All right. We've
10 Q Anything else? 11:55:46	10 been going for a bit. Why don't we go off the 12:01:09
11 A Not that I -- not that I recall.	11 record.
12 Q At some point did you tell anyone else at	12 MR. NEUKOM: Sounds good.
13 Stanford that you were writing this IP support?	13 THE VIDEO OPERATOR: Going off the record,
14 A I told my boss, Steve Hanson, and I also	14 the time is 12:01 p.m.
15 discussed it with Len Bosack. 11:56:28	15 (Recess, 12:01 p.m. - 12:48 p.m.) 12:01:15
16 Q Tell me about your discussion with	16 (Exhibit 29, Exhibit 30 and Exhibit 31
17 Mr. Hanson. What did you say to him?	17 were marked for identification and are
18 A "This is what I'm doing in my spare time."	18 attached hereto.)
19 Q And what did he say?	19 THE VIDEO OPERATOR: Back on the record.
20 A "Fine." 11:56:54	20 The time is 12:48 p.m. 12:47:54
21 Q And what did you tell Mr. Bosack?	21 BY MR. FERRALL:
22 A That I was -- I don't remember the details	22 Q Good afternoon, Mr. Lougheed.
23 of what I told him. We had technical discussions.	23 I'd like to hand or have handed to you
24 Q What were the technical discussions about?	24 three exhibits that we had marked at the break, and
25 A How elements of the protocol suite worked, 11:57:42	25 I'll identify them for the record. But they're 12:48:12
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1 right now. 12:58:39	1 calls for a conclusion. 13:03:06
2 Mr. Lougheed, you have to understand,	2 THE WITNESS: Documents whose name I do
3 we've got a lot to cover today, and I need to --	3 not recall.
4 A And I'm also under oath, and I want to	4 BY MR. FERRALL:
5 make sure my replies to your answers (sic) are 12:58:47	5 Q Can you describe generally what they were? 13:03:16
6 correct.	6 A They were documents that described a
7 Q Okay. So I'm asking you -- you can put	7 packet format and described an associated state
8 the document down, frankly.	8 machine.
9 Do you ever recall reviewing an RFC for an	9 Q Is the address resolution protocol
10 address resolution protocol? 12:58:58	10 referred to simply by the acronym ARP? 13:03:59
11 A Yes, I do recall reviewing a document --	11 A There's a general concept of an address
12 it may have been an RFC -- on address resolution.	12 resolution protocol, and then there's one, possibly
13 Q Do you know who developed address	13 more, that are -- may be described in various
14 resolution protocols?	14 documents from the IETF.
15 A I don't recall. 12:59:20	15 Q When did you first hear -- have you ever 13:04:52
16 Q Did you contribute to that field?	16 heard the address resolution protocol abbreviated as
17 A No.	17 ARP?
18 Q All right. Do you know David Plummer?	18 A Yes.
19 A I have heard the name before but I don't	19 Q When did you first hear that abbreviation?
20 know the person. 12:59:31	20 A I don't recall -- I don't recall the 13:05:17
21 Q How many IETF RFCs have you authored in	21 precise time.
22 whole or in part?	22 Q Was it while you were still at Stanford?
23 A Two, maybe three.	23 A It certainly could have been.
24 Q What were the subject or subjects of those	24 Q Did you develop any features for the
25 RFCs? 13:00:07	25 address resolution protocol yourself? 13:05:52
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1 A They were all on the border gateway 13:00:09	1 MR. NEUKOM: Objection. Vague. 13:05:56
2 protocol.	2 THE WITNESS: I do not understand your
3 Q Has Cisco ever had any policies about	3 question. What do you mean, develop features for
4 their employees submitting RFCs to the IETF?	4 the address resolution protocol?
5 A I'm not aware of any specific policies. 13:01:02	5 BY MR. FERRALL: 13:06:12
6 Q Did the software that you worked on at	6 Q Fair enough. Let me ask it a different
7 Stanford, the routing and terminal server software	7 way.
8 we talked about, did that include an address	8 Did you contribute to any IETF RFC
9 resolution protocol?	9 relating to the address resolution protocol?
10 MR. NEUKOM: Objection to form. Vague. 13:02:09	10 MR. NEUKOM: Objection. Asked and 13:06:27
11 BY MR. FERRALL:	11 answered.
12 Q I should say an address resolution	12 THE WITNESS: No.
13 protocol feature.	13 BY MR. FERRALL:
14 MR. NEUKOM: Same objection.	14 Q Did you develop features at -- while at
15 THE WITNESS: Yes. 13:02:23	15 Cisco that relate to ARP, if you don't mind me using 13:06:44
16 BY MR. FERRALL:	16 the acronym?
17 Q And what were the sources of information	17 A I don't understand the question.
18 for you in order to -- well, strike that.	18 Q Who is Glenn Truitt?
19 Did you write software for the address	19 A He's a -- at my time at Stanford, he was a
20 resolution protocol feature? 13:02:38	20 graduate student. 13:08:37
21 A Yes.	21 Q Did you work with him while at Stanford?
22 Q And what were the sources of information	22 A Briefly.
23 that you used to prepare that address resolution	23 Q In what capacity?
24 protocol feature?	24 A I recollect that he may have written a
25 MR. NEUKOM: Objection to form. Vague, 13:02:58	25 user guide to the software at the time, but that's 13:09:21
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13:48:49

1 (Exhibit 35 was marked for identification 16:48:10
2 and is attached hereto.)
3 BY MR. FERRALL:
4 Q We've marked as Exhibit 35 a set of emails
5 bearing control numbers CSI-CLI-01134849 to 850. 14:03:19
6 This appears to be some email exchange
7 between you and Joe Hielscher.
8 Did I say that right?
9 A I have no idea if you said it correctly.
10 Q Do you know who he is? 14:03:47
11 A I think he's a communications person
12 working at Cisco.
13 Q Okay. My question here is just about your
14 email at the top of the first page. You explain in
15 the first sentence that Releases 8, 9 and 10 can be 14:04:22
16 found on a volume if you have a UNIX account. And
17 then you write, "Releases 5, 6 and 7 are likely
18 lost, since I believe their archives were deleted by
19 someone."
20 Do you -- do you have a recollection about 14:04:43
21 whether releases of IOS are -- were lost at some
22 point?
23 A Yes.
24 Q Were they? Were certain releases lost?
25 A Yes. The source code to a number of early 14:05:11
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13:49:27

13:50:36
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13:51:05

13:51:30

13:51:39

13:51:57

14:03:07

14:05:17

14:05:49

14:06:18

14:06:48

14:07:14

14:07:54
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1 releases was stored on a machine that was
2 decommissioned when nobody -- nobody clever was
3 looking in that direction.
4 Q And when did that happen, do you know?
5 A I don't know when it happened. Possibly 14:05:49
6 early '90s.
7 (Exhibit 36 was marked for identification
8 and is attached hereto.)
9 BY MR. FERRALL:
10 Q We've marked as Exhibit 36 a document 14:06:18
11 entitled "Stanford Ethernit/Gateway User and
12 Configuration Guide." bearing control numbers
13 CSI-CLI-01315523 to 5568.
14 Do you recognize Exhibit 36?
15 A Yes, I do. 14:06:48
16 Q And did you co-author this?
17 A Yes.
18 Q With Mr. Truitt?
19 A Yes.
20 Q Was this a -- what was the purpose of this 14:07:14
21 guide?
22 A To describe to users and administrators
23 the functionality and operation of the -- of the
24 software.
25 Q And which software is this describing? 14:07:54
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1 exhibit. 14:20:06	1 Q Did Cisco use the word "mode" in 14:25:27
2 (Exhibit 37 was marked for identification	2 describing its functionality of its software?
3 and is attached hereto.)	3 A We had -- there would be -- the phrase
4 BY MR. FERRALL:	4 "configuration mode" was certainly being used at
5 Q We've marked as Exhibit 37 a document 14:20:18	5 this time. 14:25:46
6 entitled "cisco Systems AGS User Manual System	6 Q Okay. And how did -- how did
7 Version 6.0." It bears control numbers	7 "configuration mode" differ from any other mode of
8 CSI-CLI-00358166 to 222.	8 operation?
9 Do you recognize Exhibit 37?	9 A It allowed you to type in command
10 A I do. 14:20:38	10 expressions that affected the configuration of the 14:26:04
11 Q Did you help prepare it?	11 system.
12 A I did.	12 Q And if you weren't in configuration mode,
13 Q And this is -- this is the manual that	13 how would you describe whatever mode you were in?
14 accompanied Version 6 of Cisco's software release;	14 A You were -- at this time you would have
15 is that correct? 14:20:58	15 said you are at the EXEC. 14:26:32
16 A Correct.	16 Q What does "EXEC" mean?
17 Q Do you recall who else would have helped	17 A It was the term that I chose to refer to
18 you prepare Exhibit 37?	18 the -- all the stuff that wasn't the configuration
19 A I believe I was the sole author.	19 mode.
20 Q Who -- strike that. 14:22:42	20 Q Give me an example of what that stuff is 14:27:08
21 IOS has different modes, correct?	21 or was.
22 MR. NEUKOM: Objection. Vague, compound.	22 A The commands for connecting to other
23 THE WITNESS: Yes.	23 computers on the network, the class of command
24 BY MR. FERRALL:	24 expressions that we call the "show" commands.
25 Q In the current version of IOS, how many 14:23:18	25 Basically the set of commands that did not 14:27:48
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1 different modes are there? 14:23:20	1 reveal -- basically mostly status commands and ones 14:27:53
2 A A lot.	2 for handling connections over the network to other
3 Q Do you know how many?	3 hosts, sort of a subset of the -- of the terminal
4 A No, not at present.	4 server commands.
5 Q More than five? 14:23:44	5 Q And you said you chose the term "EXEC," 14:28:26
6 A Yes.	6 that's E-X-E-C; is that right?
7 Q More than ten?	7 A Yes.
8 A Probably.	8 Q You chose that term, yes?
9 Q Were there different modes in the	9 A Yes.
10 original -- actually, strike that. 14:24:04	10 Q How did you come up with that term? 14:28:39
11 Let me ask terminology.	11 A Well, I had a number of possible ways of
12 What did you call the original Cisco	12 describing it. I could have used "shell" after
13 software before it became known as IOS?	13 the -- modeling it along the UNIX way of -- UNIX
14 A The gateway software. The router	14 equivalent.
15 software. The terminal server software. The AGS 14:24:25	15 From -- I decided EXEC in sort of -- you 14:29:15
16 software. There was no branding.	16 know, inspired by the TOPS-20 command processor.
17 Q This Exhibit 37 refers to "AGS User	17 You know, calling it the command processor would
18 Manual."	18 have been another possibility.
19 What does AGS stand for?	19 There was a number of possibilities that I
20 A Advanced gateway server. 14:24:45	20 could have called it, what I could have called that 14:29:38
21 Q Okay. At the time of Version 6 of the	21 particular part of the software, and I ended up
22 Cisco software, how many different modes were there,	22 choosing EXEC.
23 do you know?	23 Q Now, were you responsible for determining
24 A So I don't understand how you're using the	24 the prompt symbol on the interface?
25 word "mode." 14:25:21	25 I'm sorry. Let me be clear. 14:30:26
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1 I'm talking about on the interface line, 14:30:28	1 Q And you're not aware of any use of a hash 14:35:22
2 there are symbols that precede the input point, such	2 sign as a prompt?
3 as a hash sign, for example, right?	3 A Not to my recollection.
4 A So for -- I was responsible for choosing	4 Q You were familiar with UNIX in the mid
5 the prompts for the command line interface, for the 14:30:45	5 1980s, right? 14:36:18
6 CLI	6 A As a user of UNIX.
7 Q Okay And tell me what those prompts are.	7 Q And -- by the way, are you familiar with
8 the various prompts that the Cisco CLI uses	8 Linux?
9 A There are many right now But at the time	9 A Only as a user.
10 there was the -- the unprivileged EXEC commands, and 14:31:09	10 Q When did you first become familiar with 14:36:38
11 that was the host name of the -- of the router or --	11 Linux?
12 of the router, followed by a close angle bracket	12 A With Linux? I think I first heard mention
13 There was a privileged mode, and it	13 of it in the late '90s.
14 changed that prompt to a hash mark	14 Q Did Cisco come up with the nomenclature of
15 And in the initial implementation of 14:31:55	15 calling a mode "privileged," to your knowledge? 14:38:02
16 configuration mode, there was no prompt	16 A I don't believe -- I don't believe Cisco
17 Q Okay How did you choose the hash prompt	17 came up with that terminology.
18 for the privileged mode?	18 Q Let me turn to the current set of IOS CLI
19 A It was visually large and different than	19 commands.
20 the -- different -- just different than the 14:32:25	20 I don't expect an exact number, but do you 14:38:54
21 unprivileged EXEC prompt	21 know approximately how many IOS CLI commands there
22 Q Okay How did you use the unprivileged	22 are today?
23 close angle bracket prompt?	23 A I would have to guess. It is a -- it's a
24 A I don't understand your question	24 very large number.
25 Q Did you choose to use the close angle 14:32:59	25 Q Can you just give me a ballpark? 14:39:15
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1 bracket prompt? 14:33:02	1 A I believe it's in the low thousands. 14:39:20
2 A Router name, close angle bracket.	2 Q Do you know if it's more or less than
3 Q Right.	3 5,000?
4 A Yes, I chose that.	4 A No, I don't. I've not counted it. I've
5 Q Okay. How did you come to choose that? 14:33:09	5 not -- I've not counted it, nor have I heard of 14:39:43
6 A Well, there were -- when you have multiple	6 somebody who has counted how many there are and how
7 devices on a network, one of the first things you	7 many variations there are in total.
8 want to know if you're typing at something is to	8 Q What is IOS XR?
9 what you are typing at. So that -- sort of the most	9 MR. NEUKOM: Objection. Asked and
10 aesthetic choice was the -- was the name of the 14:33:51	10 answered. 14:40:16
11 device.	11 THE WITNESS: IOS XR is a Cisco-developed
12 And the angle bracket was a nice visual	12 variant of IOS for the -- for the service provider
13 way of terminating -- you know, here's where your	13 marketplace.
14 type-in begins. Here's where the prompt ends,	14 BY MR. FERRALL:
15 here's where the type-in begins. 14:34:19	15 Q Does IOS XR have a different set of CLI 14:40:43
16 Q Had you ever seen the angle bracket used	16 commands?
17 as a prompt in any other system?	17 A It has --
18 A I wasn't aware of any generally available	18 Q From IOS, that is.
19 host -- general purpose timesharing that actually	19 A It is substantially the same. There is
20 that was the default, that was the prompt. 14:34:56	20 functionality that exists only for a service 14:41:02
21 Q I'm not sure what you mean by that.	21 provider that has commands that are not contained in
22 But had you ever seen any system that used	22 the other variants of IOS.
23 a close angle bracket as a prompt?	23 Q What is IOS XE?
24 A No. TOPS-20 used an "at" sign and UNIX	24 A That is a variant of IOS.
25 used a percent sign. 14:35:19	25 Q What's the purpose of that variant? 14:41:27
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1 Q Why did you feel that way? 14:51:39	1 BY MR. FERRALL: 14:55:22
2 A Because the changes that I had in mind	2 Q In what ways does it have value for Cisco?
3 were basically minor tweaks that didn't add value.	3 MR. NEUKOM: Same objections.
4 Q Do Cisco customers invest in training to	4 THE WITNESS: It is the -- it's the look
5 become familiar with Cisco's CLI? 14:52:24	5 and feel of Cisco router software. 14:55:38
6 MR. NEUKOM: Objection. Vague, compound	6 BY MR. FERRALL:
7 and foundation.	7 Q Why is that valuable?
8 THE WITNESS: I have no reason to believe	8 MR. NEUKOM: Objection. Calls for
9 that they don't.	9 opinion, and vague.
10 BY MR. FERRALL: 14:52:41	10 THE WITNESS: It lets customers know what 14:56:11
11 Q Do you know that they do?	11 they are getting.
12 MR. NEUKOM: Same objections.	12 BY MR. FERRALL:
13 THE WITNESS: I don't have direct	13 Q Can you explain that more? How does a CLI
14 experience with customers' network operations.	14 command set let customers know what they are
15 BY MR. FERRALL: 14:52:59	15 getting? 14:56:37
16 Q Well, but you're familiar with the whole	16 A There is a -- it's a look and feel that
17 Cisco certification process, aren't you?	17 long-time customers are familiar with, are
18 A I know of it.	18 comfortable with, and it represents that this is
19 MR. NEUKOM: Objection. Vague.	19 a -- this is a Cisco product, not necessarily
20 BY MR. FERRALL: 14:53:13	20 somebody else's product. 14:57:24
21 Q What is that process? Can you tell me	21 MR. NEUKOM: Brian, whenever you think is
22 what you know about it?	22 a good time. I think we've been going about an
23 A It is a set of training and a	23 hour.
24 certification that you have understood the training	24 MR. FERRALL: Okay. Okay. We can take a
25 involved in networking. 14:53:29	25 break. 14:58:04
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1 Q What's Cisco's role in -- strike that. 14:53:35	1 THE VIDEO OPERATOR: Going off the record. 14:58:06
2 What are the levels of certification one	2 the time is 2:58 p m
3 can get from that training, do you know?	3 (Recess, 2:58 p m - 3:24 p m)
4 A I do not know.	4 THE VIDEO OPERATOR: Back on the record
5 Q Have you ever heard of the term CCIE? 14:53:51	5 The time is 3:24 p m 15:24:02
6 A Yes, I have.	6 BY MR. FERRALL:
7 Q What's that?	7 Q Mr. Lougheed, when did you first become
8 A I believe it's Cisco certified Internet	8 aware of DOS, D-O-S?
9 engineer. I'm not sure.	9 A I'd say whose DOS?
10 Q Do you know what Cisco's role is in 14:54:10	10 Q MS-DOS 15:24:36
11 determining that certification for a CCIE?	11 A MS-DOS? I probably heard about it when
12 A I'm not familiar with the details of that	12 IBM announced the IBM PC
13 program.	13 Q Do you recall that MS-DOS uses a close
14 Q Does Cisco itself provide training?	14 angle bracket as a prompt?
15 MR. NEUKOM: Objection. Vague. 14:54:35	15 A Now that you remind me, it does 15:25:16
16 BY MR. FERRALL:	16 Q Do you think you might have been inspired
17 Q Training to learn how to use Cisco devices	17 by that prompt when you chose the close angle
18 and use the CLI?	18 bracket for Cisco's prompt?
19 A Not for customers. I don't believe it	19 A No I was not a DOS user
20 provides training for customers. 14:54:53	20 Q So it's just a coincidence that you and 15:25:34
21 Q Do you think that the Cisco CLI has value	21 DOS came up with the same prompt, to your knowledge?
22 to Cisco?	22 MR. NEUKOM: Objection Asked and
23 MR. NEUKOM: Objection. As phrased, calls	23 answered
24 for opinion. Also, vague and compound.	24 THE WITNESS: I was not a DOS user I
25 THE WITNESS: Yes, it has value. 14:55:21	25 first -- I was not a DOS user 15:26:06
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1	MR. FERRALL: Let's mark this as the next	15:26:35	1	message indicates that you are looking at an error	15:29:49
2	exhibit.		2	message. An ancient operating system called TOPS-20	
3	(Exhibit 38 was marked for identification		3	used such a convention and I adopted it."	
4	and is attached hereto.)		4	Do you see that?	
5	BY MR. FERRALL:	15:26:37	5	A Yeah, I do see that.	15:29:59
6	Q Exhibit 38 is a set of emails between you		6	Q Why did you adopt a TOPS-20 convention?	
7	and Mr. Remaker, among others. It bears control		7	A Of the possibilities that I had, that	
8	numbers CSI-ANI-00043306.		8	seemed -- that seemed a reasonable -- to me, it	
9	A Okay. I'd like to read this.		9	seemed like a reasonable way of doing things	
10	Q First let me ask you the question so you	15:27:19	10	Q Did you get permission from Digital	15:30:32
11	know what to look for.		11	Equipment Company to use that convention?	
12	A I will forget the question by the time I'm		12	MR. NEUKOM: Objection. Calls for a legal	
13	done reading this.		13	conclusion and misstates prior testimony.	
14	Q Well, Mr. Loughheed, that's not the way it		14	THE WITNESS: No, I did not seek	
15	works, actually. I ask the question and you answer	15:27:28	15	permission.	15:30:55
16	it.		16	BY MR. FERRALL:	
17	A Okay.		17	Q Have you ever heard of the acronym RIP in	
18	Q If you can't answer it, then you tell me.		18	the context of networking?	
19	My only question is, did you send the		19	A It typically means routing information	
20	email that's at the top of Exhibit 38, the one at	15:27:38	20	protocol.	15:31:18
21	12-11-2008 at 10:14 p.m.?		21	Q You're familiar with that protocol?	
22	MR. NEUKOM: Mischaracterizes the document		22	A It's been a while, but yes, I'm familiar	
23	on its face.		23	with it.	
24	And I know that Mr. Ferrall would like you		24	Q Did you make up the acronym RIP for	
25	to feel comfortable to read the page-and-a-half	15:27:54	25	routing information protocol?	15:31:32
	Page 122			Page 124	
1	document that he's just put in front of you before	15:27:57	1	A No, I did not make up that acronym.	15:31:37
2	answering his question.		2	Q Did you make up the term "routing	
3	THE WITNESS: Okay. I'll read it.		3	information protocol"?	
4	MR. FERRALL: Actually, no, I would like		4	A No.	
5	him to answer the question.	15:28:03	5	Q Did you submit an RFC for the routing	15:31:51
6	Q Are you telling me you can't tell me		6	information protocol?	
7	whether you sent the email?		7	A No.	
8	MR. NEUKOM: It's a totally unfair		8	Q Do you know who did?	
9	question. The email that he sent would necessarily		9	A No, I don't know who did.	
10	include everything that follows.	15:28:10	10	Q Did you ever ask permission from the	15:32:25
11	If you want him to tell you whether he		11	person who made up the term "RIP" for permission to	
12	remembers this or whether he sent it, let him read		12	use it, to use that term?	
13	the document. Come on, Brian.		13	MR. NEUKOM: Objection. Foundation,	
14	It's a page and a half. We're not talking		14	vague, and calls for a legal conclusion.	
15	about him wasting 30 minutes to read a product	15:28:20	15	THE WITNESS: There was no one whose	15:32:50
16	manual. It's a page-and-a-half email. The witness		16	permission one could ask.	
17	has said he wants to read it, and we're going to let		17	BY MR. FERRALL:	
18	him read it.		18	Q Well, I'll tell you, a Mr. Charles Hedrick	
19	THE WITNESS: Okay. I've read it.		19	at Rutgers submitted what I believe to be the first	
20	BY MR. FERRALL:	15:29:28	20	RFC on the routing information protocol.	15:33:05
21	Q Okay. Did you send this email that's		21	Do you know Mr. Hedrick?	
22	dated December 11, 2008, at 10:14 p.m.?		22	A I do.	
23	A I believe I did.		23	Q Did you ever ask him for permission to use	
24	Q Okay. And in the last paragraph of that		24	the term "RIP"?	
25	email, you write, "The percent sign leading a	15:29:41	25	MR. NEUKOM: Objection. Asked and	15:33:15
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1 answered. 15:33:15	1 MR. NEUKOM: Objection. Compound, vague. 15:37:00
2 THE WITNESS: Mr. Hedrick formally	2 THE WITNESS: -- we did not make any such
3 documented an informal standard that was already in	3 assertions.
4 use in the industry for a number of years.	4 MR. NEUKOM: And foundation.
5 BY MR. FERRALL: 15:33:27	5 BY MR. FERRALL: 15:37:08
6 Q And what's the significance of that?	6 Q Did you ever have an agreement with
7 MR. NEUKOM: Objection. Calls for	7 Mr. Rekhter about the right to use any of his
8 speculation.	8 contributions to the BGP work that you guys did?
9 THE WITNESS: It wouldn't have occurred to	9 MR. NEUKOM: Vague, compound, calls for a
10 me to ask him for permission. 15:33:47	10 legal conclusion -- 15:37:44
11 BY MR. FERRALL:	11 THE WITNESS: Could you --
12 Q I think you testified earlier that you	12 MR. NEUKOM: -- and mischaracterizes prior
13 submitted several RFCs for the border gateway	13 testimony.
14 protocol, correct?	14 THE WITNESS: Could you repeat the
15 A Correct. 15:34:07	15 question, please? 15:37:59
16 Q And your co-author on at least the first	16 BY MR. FERRALL:
17 such RFC was a Mr. Yakov Rekhter, correct?	17 Q Sure. I'll ask a slightly different
18 A Correct.	18 question.
19 Q Was he your co-author on the subsequent	19 Did you ever ask permission from
20 submissions, too, do you know? 15:34:31	20 Mr. Rekhter to use any of his contributions to the 15:38:09
21 A Certainly on the second one. I don't	21 BGP project?
22 recall on the third one. And after that, there were	22 MR. NEUKOM: Objection. Vague, compound,
23 other co-authors.	23 calls for a legal conclusion.
24 Q And where does Mr. Rekhter or did	24 THE WITNESS: We did not seek permission
25 Mr. Rekhter work at the time? 15:34:50	25 from one another for our individual contributions. 15:38:26
Page 126	Page 128
1 A He worked for IBM. 15:34:52	1 BY MR. FERRALL: 15:38:30
2 Q What was Mr. Rekhter's contribution to the	2 Q Okay. IBM didn't ask you for permission,
3 BGP RFC? The first one?	3 either, correct?
4 A We were co-designers.	4 A No.
5 Q Are you able to describe what he 15:35:28	5 Q One of the CLI terms in this case is the 15:39:20
6 contributed as opposed to what you contributed?	6 term "IP address."
7 A No. We worked closely together.	7 Are you familiar with that?
8 Q Do you know whether you ever made any	8 A I'm familiar with the command expression
9 declarations to the IETF concerning copyrights that	9 "IP address."
10 Cisco claimed in any of the language in the first 15:35:57	10 Q Did you come up with the phrase "IP 15:39:33
11 BGP RFC?	11 address"?
12 MR. NEUKOM: Objection. Vague, compound.	12 A When Cisco came out of Stanford, we were
13 THE WITNESS: To the best of my	13 shipping an IP -- an Internet protocol only router.
14 recollection, we made no copyright claims in the	14 And there was a command "address" that took some
15 first BGP RFC. 15:36:17	15 arguments. 15:40:12
16 BY MR. FERRALL:	16 And after -- after a while, we started
17 Q Did Cisco make any disclosures to the IETF	17 adding other protocols to the software. The first
18 regarding copyright claims in any of the BGP RFCs?	18 one was "DECnet." And since "address" was already
19 MR. NEUKOM: Objection. Compound, vague.	19 taken to refer to IP functionality, Internet
20 THE WITNESS: Not to my knowledge. 15:36:35	20 protocol functionality, we came up with "DECnet 15:40:44
21 BY MR. FERRALL:	21 address," and then had a DECnet address after it.
22 Q Did you ever make a disclosure to the	22 That "DECnet address" command could have
23 Internet Architecture Board of any intellectual	23 very well have said "address," and then DECnet
24 property rights in BGP, to your knowledge?	24 addresses look different than IP addresses, and we
25 A To my knowledge -- 15:36:57	25 could have had the software figure out which type of 15:41:11
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1 address we were referring to. But we chose "DECnet 15:41:13	1 referring to? 15:44:36
2 address."	2 A That was the aesthetic choice I made.
3 It became clear that much more -- that we	3 MR. NEUKOM: Objection. Mischaracterizes
4 were becoming a multi-protocol router. We were	4 prior testimony.
5 adding other protocols into the box, into the 15:41:27	5 THE WITNESS: There were many possible 15:44:49
6 software.	6 ways of doing it. As I indicated, I could perhaps
7 And I had -- I value -- I value the	7 take a look at an address and then infer what it
8 aesthetic of having a symmetric-looking command line	8 was. But that was not the choice that I made at the
9 expression, symmetric hierarchy. It was clear we	9 time.
10 were heading towards a hierarchy. 15:41:52	10 BY MR. FERRALL: 15:45:07
11 So at some point after DECnet and perhaps	11 Q What were the alternative commands that
12 a few other protocols to make things look very	12 you considered for "IP host"?
13 similar, we started prefacing our IP-only commands	13 A "Name." "Name" was certainly one of the
14 with "IP." And that gave a very -- what I thought	14 possible candidates. "Network system" or
15 was a very elegant, symmetric, elegant way of 15:42:16	15 "system" -- there are many, many words that one 15:45:51
16 referring to different protocols within a	16 could use to refer to all sorts of different things.
17 multi-protocol router.	17 Q Okay. But now you're talking about
18 So that is the history of the "IP address"	18 alternatives for the word "host," right?
19 command.	19 A Um-hum.
20 Q Okay. My question was simpler. I 15:42:36	20 Q Okay. You didn't -- you're not the first 15:46:08
21 appreciate that answer. But my question was a	21 one to use the word "host," are you?
22 little simpler than that, but let me ask it a	22 A No.
23 different way.	23 Q I mean, "host" had been used for -- well
24 You had heard of the term "IP address"	24 before you joined Cisco to refer to a computer host.
25 before you joined Cisco, hadn't you? 15:42:51	25 It's a conventional term, right? 15:46:29
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1 MR. NEUKOM: Objection. Vague and asked 15:42:59	1 MR. NEUKOM: Objection. Vague, compound, 15:46:31
2 and answered.	2 foundation, and calls for opinion testimony.
3 THE WITNESS: I suppose I had. When one	3 THE WITNESS: It was one of the
4 is talking about different networking protocols, one	4 possibilities that I had -- that I had.
5 needs to clarify which networking protocol one is 15:43:10	5 BY MR. FERRALL: 15:46:46
6 talking about. So it was probably terminology that	6 Q And "host" was the term that was used in
7 was in the air.	7 the commands in the software that came from
8 BY MR. FERRALL:	8 Stanford; is that right?
9 Q Does the same go for "IP host," also? You	9 MR. NEUKOM: Objection. Mischaracterizes
10 had heard that before you joined Cisco? 15:43:29	10 prior testimony. 15:47:13
11 MR. NEUKOM: Objection. Misstates prior	11 THE WITNESS: I had implemented the "host"
12 testimony.	12 command while I was at Stanford.
13 THE WITNESS: The original form of the	13 BY MR. FERRALL:
14 "host" command was just "host command." It was	14 Q Okay. And what did you -- so did you
15 another one that had to distinguish, in a 15:43:41	15 decide to use the word "host" for the command on the 15:47:27
16 multi-protocol world, in a multi-protocol piece of	16 software you worked at while you were employed by
17 software, what you were talking about.	17 Stanford?
18 It would have looked very odd in a	18 MR. NEUKOM: Objection. Vague.
19 multi-protocol router that there was one protocol	19 THE WITNESS: Could you restate that
20 that wasn't prefaced by a -- some descriptive 15:44:03	20 question? 15:47:50
21 keyword.	21 BY MR. FERRALL:
22 BY MR. FERRALL:	22 Q Sure.
23 Q Following up on that, the purpose of your	23 For the software that -- strike that.
24 use of "IP" as the first keyword in that command "IP	24 For the gateway TIP software that you
25 host" was to distinguish the protocol that it's 15:44:33	25 worked on while you were employed at Stanford, was 15:48:02
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1 interface, and it would -- as a packet that was	16:12:12	1 the like, or "database lookup" or...	16:16:59
2 being sent -- sent out that interface, it could		2 BY MR. FERRALL:	
3 either be permitted or denied going through that		3 Q Did you coin the term "domain lookup"?	
4 interface.		4 A I decided to use that as a command	
5 Those were the two original uses of the	16:12:29	5 expression within the software, yes.	16:17:21
6 "access list" command expression.		6 Q I'll ask the question one more time. I'm	
7 Q Do you believe that you coined the term		7 asking you if you coined the term "domain lookup."	
8 "access list"?		8 MR. NEUKOM: Objection. Asked and	
9 A It was my choice to use that description.		9 answered and vague.	
10 Q Well, I'm asking you if you coined that	16:12:56	10 THE WITNESS: I did not.	16:17:43
11 term, or had you ever heard that term before in the		11 BY MR. FERRALL:	
12 context of networking?		12 Q Do you know who did?	
13 MR. NEUKOM: Objection. Vague, compound,		13 A No idea.	
14 asked and answered.		14 Q When was -- to your knowledge, when was	
15 THE WITNESS: I do not believe that I had	16:13:13	15 the term "routing" ever used in conjunction with the	16:18:41
16 heard the term before.		16 Internet protocol?	
17 BY MR. FERRALL:		17 MR. NEUKOM: Objection. Vague and	
18 Q Had you heard the term "IP access group"		18 foundation.	
19 before?		19 THE WITNESS: I don't know when the term	
20 A Yes.	16:13:25	20 "routing" was used.	16:19:05
21 Q Who coined that term, to your knowledge,		21 BY MR. FERRALL:	
22 do you know?		22 Q Were people in the field talking about	
23 A I did.		23 routing in connection with IP before you joined	
24 Q Under what circumstances? Or for what		24 Cisco?	
25 purpose, I should say?	16:13:39	25 MR. NEUKOM: Objection. Vague, compound.	16:19:24
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1 A I don't remember the exact details, but it	16:13:52	1 THE WITNESS: Yes	16:19:27
2 is -- either assigns an access list to an interface		2 BY MR. FERRALL:	
3 or -- I think it assigns an interface to a -- an		3 Q Tell me what, if anything, was creative	
4 access list to an interface. I believe it's access		4 about your decision to use the term "IP routing" as	
5 class or something like that that assigns it to an	16:14:07	5 a CLI command	16:19:51
6 interface or to a line number.		6 MR. NEUKOM: Objection. Calls for opinion	
7 Q The term "domain name" is not a term that		7 testimony	
8 you made up, is it?		8 THE WITNESS: At Stanford where we had	
9 A No, I didn't make -- I -- no, I did not.		9 terminal servers and gateways in the same software,	
10 Q "Domain name" is a term that goes back to	16:15:38	10 there were times when it was convenient -- just	16:20:26
11 the ARPANET, actually. Are you aware of that?		11 because something had multiple interfaces, it could	
12 MR. NEUKOM: Objection. Foundation.		12 still perhaps be a terminal server. So I needed a	
13 THE WITNESS: I would be unsurprised if it		13 way of turning off, disabling routing functionality	
14 went back that far.		14 And I used the command -- I chose the	
15 Are you referring to ARPANET protocols or	16:16:02	15 keyword -- configuration keyword command expression	16:21:07
16 ARPANET network?		16 "routing." Then "no routing" would turn off routing	
17 BY MR. FERRALL:		17 functionality in whatever software was running at	
18 Q The ARPANET network.		18 the time despite its hardware configuration	
19 A I believe the concept was introduced while		19 And then later on at Cisco, to keep the --	
20 the ARPANET network was still running.	16:16:15	20 keep the form of the hierarchy of commands, we added	16:21:35
21 Q What about the words "domain lookup"? Did		21 the -- we added our choice of -- we added "IP" in	
22 you coin that term "domain lookup"?		22 front of it because you could potentially turn off	
23 MR. NEUKOM: Objection. Vague.		23 other sorts of routing, or at least that was the --	
24 THE WITNESS: It's a parallel construction		24 that was the -- that was a possibility for other	
25 to terms like "address lookup" or "host lookup" or	16:16:52	25 network protocols	16:22:02
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1 product was built by one company, to use your words?	16:31:31	1 such things.	16:35:35
2 A Well, that was the belief of the		2 Q Prior to your joining Cisco, were you	
3 engineers.		3 aware of any operating systems that had two or more	
4 Q I'm asking you to explain why you believe		4 commands that began with the same first word?	
5 that.	16:31:52	5 MR. NEUKOM: Objection. Vague.	16:36:02
6 A It's an opinion of mine. I have no -- did		6 THE WITNESS: Two or more commands that	
7 not have evidence for it at the time.		7 began with the same word. I can't recall any.	
8 Q What is the alternative or alternatives to		8 MR. FERRALL: Let's mark this as the next	
9 the framework for the hierarchy you described?		9 exhibit.	
10 MR. NEUKOM: Objection. Vague and	16:32:33	10 (Exhibit 39 was marked for identification	16:48:10
11 compound, calls for speculation.		11 and is attached hereto.)	
12 THE WITNESS: So I don't have experience		12 BY MR. FERRALL:	
13 with other vendors' interfaces for routers and		13 Q Exhibit 39 is a document entitled "Cisco's	
14 networking devices. I have only had descriptions		14 Response to Arista's Interrogatory No. 16 amended	
15 from others of styles of interfaces.	16:33:01	15 Exhibit D-1 (IOS Release 11.0)."	16:37:09
16 We had a competitor named Wellfleet that		16 And I assume, Mr. Loughheed, that you	
17 attempted to introduce a user interface that, as it		17 haven't seen the cover page, but tell me if you've	
18 was described to me, was typing in ASN.1 notation as		18 seen any of the inside to Exhibit 39.	
19 defined in the SNMP protocol for retrieving and		19 A I've not seen the inside of this.	
20 setting information.	16:33:27	20 Q You've never seen these images?	16:37:35
21 An ASN.1 notation is numbers and --		21 A I don't recall having seen them before.	
22 numbers and decimal points.		22 Q Okay. So if you look at -- if you go a	
23 My understanding is that it was not		23 couple of pages in, let's just take an example of	
24 popular with customers. But it was a way of		24 the "clear" command set --	
25 managing a system.	16:33:52	25 A I'd like to page through the rest of this	16:38:14
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1 BY MR. FERRALL:	16:34:00	1 before I offer a --	16:38:18
2 Q Are you aware of any other CLI command		2 MR. NEUKOM: Which page are you currently	
3 sets that are arranged hierarchically?		3 looking at, Brian?	
4 A No, I'm not.		4 MR. FERRALL: The page that begins with	
5 Q Were you aware of any -- prior to your --	16:34:16	5 the "clear" command. It's number 5, I guess. I	16:38:24
6 strike that.		6 didn't realize there were pages on here.	
7 Prior to your joining Cisco, were you		7 MR. NEUKOM: Mr. Simmons has helpfully	
8 aware of any operating systems that used multi-word		8 reminded me that we've now been on the record for an	
9 commands?		9 hour and 15 minutes. I'm open-minded on timing, but	
10 MR. NEUKOM: Objection. Vague.	16:34:39	10 when we get to a good spot, it would be nice to take	16:38:49
11 THE WITNESS: I was not aware of any		11 a short break.	
12 router or switch products that had such things.		12 MR. FERRALL: Okay. Let me just finish	
13 BY MR. FERRALL:		13 some questions about this.	
14 Q Well, were you aware of any operating		14 THE WITNESS: Okay. I've scanned it	
15 systems that used multi-word commands?	16:34:53	15 briefly.	16:39:32
16 MR. NEUKOM: Objection. Asked and		16 BY MR. FERRALL:	
17 answered.		17 Q Okay. If you could turn to page 5, which	
18 THE WITNESS: Yes.		18 is where the "clear" command set begins.	
19 BY MR. FERRALL:		19 Are you there?	
20 Q What examples were you aware of?	16:35:04	20 A Yes, I am.	16:39:39
21 A Of operating systems that had multi-word		21 Q Okay. At Cisco, do you have a terminology	
22 commands? I was most familiar with UNIX and		22 for the different levels of the hierarchy?	
23 TOPS-20.		23 A No, no particular terminology for the	
24 Q Any others?		24 hierarchy. There would be a top level command, top	
25 A I had the vague impression that VMS had	16:35:27	25 level commands and sub commands.	16:40:14
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1 Q So in this case, there's a command, for 16:40:25	1 "IF" instead of "interface." 16:45:51
2 example, "clear ARP-cache," right?	2 A It was just an example of choice of --
3 A Yes.	3 choice of word.
4 Q In that command, is that the ARP cache	4 But under discussion was rather what was a
5 that's being cleared? 16:40:55	5 hierarchy here. And these are the -- "interface" 16:46:05
6 A I believe that command clears -- clears	6 with an argument after it is the first part of a
7 all address resolution caches. There's more than	7 hierarchy.
8 one address resolution protocol in the system, or at	8 You could draw this in a tree shape, and
9 least there was when we were a primarily	9 it would be -- the hierarchy would be very obvious.
10 multi-protocol router. 16:41:19	10 Q So is it still -- would it still be using 16:46:36
11 Q Okay. If you go to page 6, the next page,	11 your hierarchy if this command were "IF Ethernet"?
12 now, for this, "interface Ethernet," is that a	12 MR. NEUKOM: Objection. Calls for
13 hierarchy?	13 speculation, vague.
14 A It is --	14 THE WITNESS: There's many other pieces to
15 MR. NEUKOM: Objection. Calls for opinion 16:42:27	15 the -- there are many other pieces to the hierarchy. 16:47:00
16 testimony.	16 This is -- I was aiming for a hierarchical,
17 THE WITNESS: It is the leading element of	17 symmetric, aesthetically pleasing set of
18 a hierarchy.	18 configuration command expressions.
19 One of the choices that I made at Stanford	19 BY MR. FERRALL:
20 actually in introducing the "interface" command was 16:42:49	20 Q Tell me about -- what's aesthetically 16:47:28
21 that it assumed a block structure where I could say	21 pleasing about this command expression "interface
22 things like "interface Ethernet zero," and then I	22 Ethernet"?
23 could say -- I could have a bunch of -- at Stanford	23 MR. NEUKOM: Objection. Calls for opinion
24 I had a bunch of what we called interface sub	24 testimony.
25 commands that would follow on subsequent lines. 16:43:17	25 THE WITNESS: This is a command fragment. 16:47:44
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1 I could very well have made the choice to 16:43:21	1 This is the leading part of a command. There's more 16:47:45
2 write that as, on one line, for example, "interface	2 to it than this.
3 Ethernet zero address," an IP address, a subnet	3 MR. NEUKOM: Brian, I think at this point
4 mask, and you would have a hierarchy of	4 we're coming up on an hour and a half. Do you mind
5 configuration stuff. 16:43:44	5 if we take a short break? 16:48:05
6 Going outside into Cisco, you could have	6 MR. FERRALL: Well, let me just ask one
7 "interface Ethernet zero." I could have "IP" and	7 more question.
8 then a bunch of IP keywords after that. I could	8 Q If you go back to the "clear" example on
9 have "interface Ethernet zero DECnet" and have a	9 page 5, am I right that your conception of a
10 bunch of DECnet keywords underneath that. And that 16:44:00	10 hierarchy for this command would still be 16:48:38
11 would very clearly demonstrate a hierarchy.	11 implemented even if the "clear" keyword command were
12 I made the aesthetic choice of saying --	12 changed to something else like "white"? Is that
13 of turning the word "interface" -- which I could	13 right?
14 have chosen something like "IF" or "net-in" or	14 MR. NEUKOM: Objection. Vague, compound,
15 something like that, but I chose "interface" -- I 16:44:23	15 hypothetical, calls for opinion testimony. 16:49:04
16 like writing words out -- I chose as a typing	16 THE WITNESS: Are you asking if I could
17 shorthand to say this is the front end of all -- of	17 have chosen another word besides "clear"?
18 the hierarchy for all the rest of these commands.	18 BY MR. FERRALL:
19 So this does -- it is a hierarchy,	19 Q No. I'm asking if you're -- another way
20 especially in the Cisco multi-protocol world that it 16:44:47	20 of asking it is does the concept of your hierarchy 16:49:18
21 evolved into.	21 depend upon the selection of the first word, or is
22 BY MR. FERRALL:	22 it independent of that?
23 Q So I'm trying to understand the nature of	23 MR. NEUKOM: Objection. Vague, calls for
24 your hierarchy.	24 speculation and opinion testimony.
25 You said, for example, you could have used 16:45:50	25 THE WITNESS: There is a limited set of 16:49:48
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1 what we could call perhaps top-level keywords, 16:49:49	1 The time is 5:13 p.m. 17:13:27
2 and -- that refer to configurable entities in the	2 (Exhibit 40 was marked for identification
3 software, in the system, that are often analogous.	3 and is attached hereto.)
4 And when you have a situation like that,	4 BY MR. FERRALL:
5 developing a hierarchy is a way of managing complex 16:50:18	5 Q Okay. We just marked as Exhibit 40 an 17:13:32
6 entities that have many similarities and a few	6 email bearing control numbers CSI-CLI-00746398. It
7 differences.	7 appears to be between you and a Craig Fox, among
8 BY MR. FERRALL:	8 others.
9 Q I'm sorry. I've got to ask the question	9 And I guess my only question for you,
10 again. If you can't answer it, tell me you can't 16:50:46	10 Mr. Lougheed, is do you have any reason to believe 17:13:57
11 answer it. But here's my question:	11 that you didn't send this email that's Exhibit 40?
12 In this example on page 5 of Exhibit 39,	12 A It looks like I sent it. I have not had a
13 does your concept of the hierarchy depicted here	13 chance to read it.
14 depend upon the choice of the first keyword?	14 Q Are you on the Parser Police mailing list?
15 MR. NEUKOM: Objection. Mischaracterizes 16:51:08	15 MR. NEUKOM: Objection. Vague. 17:14:36
16 the document and the witness's prior testimony,	16 THE WITNESS: At one point I was.
17 vague, and calls for speculation and asked and	17 BY MR. FERRALL:
18 answered.	18 Q For what period of time were you on that
19 THE WITNESS: I do not believe I can	19 mailing list?
20 improve on my answer at this point. 16:51:20	20 A I don't -- I don't remember a time period, 17:14:56
21 BY MR. FERRALL:	21 but it has been many years since I have been on that
22 Q Okay. So you couldn't tell me -- if I	22 mailing list.
23 used a different first keyword, could you tell me	23 Q Are you on the Fellows mailing list?
24 whether I'm using your hierarchy idea or not?	24 MR. NEUKOM: Objection. Vague.
25 MR. NEUKOM: Same objections. 16:51:38	25 THE WITNESS: I'm on -- I've been on 17:15:32
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1 And we'll take a break after the witness 16:51:47	1 various mailing lists that have included Cisco 17:15:33
2 answers this question	2 Fellows.
3 THE WITNESS: I've answered the question	3 BY MR. FERRALL:
4 to the best of my ability	4 Q Can you tell me which ones those are, to
5 BY MR. FERRALL: 16:52:03	5 the best of your knowledge? 17:15:44
6 Q Well, I'm entitled to an answer to this	6 A To the best of my knowledge, there was
7 one, not a reference to some past answer So listen	7 a -- an older mailing list called Fellows@cisco.com.
8 to the question	8 More recently there's a mailing list called
9 Can you tell me, if I used a different	9 DE-Fellows-Meeting-Attendees.
10 keyword instead of "clear" on page 5 of Exhibit 39, 16:52:14	10 Q And you've been on both of those? 17:16:05
11 would I still be using your concept of a hierarchy?	11 A Yes.
12 MR. NEUKOM: Same objections	12 Q I don't have any other questions about
13 And we're about five questions beyond the	13 that.
14 one question you asked for before a break	14 A Okay. I rather liked what I wrote.
15 THE WITNESS: There is -- there's the 16:52:46	15 Q Tell me what a loopback is. Are you 17:16:35
16 abstract concept of a hierarchy, and I -- I	16 familiar with that term?
17 basically don't understand what you're getting at	17 A It's a term -- I believe it originated in
18 I've answered the question to the best of	18 electronics, certainly in pieces of hardware, where
19 my ability	19 you can take the output signal of a device and put
20 MR. FERRALL: Okay All right Let's go 16:53:22	20 it into -- to input and see if it receives it 17:17:18
21 off the record	21 correctly.
22 THE VIDEO OPERATOR: Going off the record,	22 It tests the internal state machine of
23 the time is 4:53 p m	23 whatever entity you're testing.
24 (Recess, 4:53 p m - 5:13 p m)	24 Q When did you first hear it used in the
25 THE VIDEO OPERATOR: Back on the record 17:07:48	25 networking context? 17:17:35
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1 command "clear" that blanks a screen. I'm not aware 17:47:22	1 jitter in the positioning so that it wouldn't burn 17:52:31
2 of any operating system that uses "clear" in the	2 in those letters in the -- in one spot in the
3 sense that the Cisco CLI uses "clear."	3 terminal.
4 BY MR. FERRALL:	4 Then I think after we left Stanford --
5 Q Tell me about the creative process that 17:47:57	5 actually, I'm not clear when the MOTD was 17:52:55
6 went into your selection of the word "clear" as the	6 implemented. I suspect it was after I left
7 first keyword in these commands.	7 Stanford, but I'm not -- my memory is not clear on
8 MR. NEUKOM: Objection. Vague and	8 that.
9 compound.	9 Q So to be clear, you're not saying that you
10 THE WITNESS: I needed some way of 17:48:19	10 came up with the term "banner" as a command, are 17:53:15
11 resetting or clearing data structures in the box,	11 you?
12 something that's very useful in the debugging of --	12 MR. NEUKOM: Objection. Misstates prior
13 that sort of action is very useful in debugging	13 testimony, vague.
14 software, correcting problems in a running system	14 THE WITNESS: I implemented certain
15 and the like. 17:48:53	15 functionality that I triggered with that 17:53:26
16 And "reset" or "clear" or "zero" or	16 configuration command.
17 "restart" certainly could have been possibilities.	17 BY MR. FERRALL:
18 It was a very generically simple example. It was	18 Q I'm going to ask the question again.
19 another sort of generic activity of I wanted to	19 Are you saying that you came up with the
20 clear or reset some data structures. And that 17:49:20	20 term "banner" as a command? 17:53:38
21 one -- I don't recall, but I suspect that one seemed	21 MR. NEUKOM: Same objections.
22 reasonable and came to mind.	22 THE WITNESS: That was a choice that I
23 BY MR. FERRALL:	23 made.
24 Q Do you recall why you selected the word	24 BY MR. FERRALL:
25 "clear"? 17:49:47	25 Q You borrowed it from another operating 17:53:55
Page 174	Page 176
1 A It seemed -- it seemed aesthetically 17:49:52	1 system, didn't you? 17:53:57
2 pleasing to me. It was something that was	2 MR. NEUKOM: Objection. Asked and
3 descriptive of an action that I wanted to take that	3 answered.
4 was a fairly generic action, a fairly common action.	4 THE WITNESS: I have no memory of
5 Q What does "banner MOTD" mean? 17:50:47	5 borrowing it. 17:54:05
6 A MOTD is message of the day.	6 BY MR. FERRALL:
7 Q Did you make up that acronym?	7 Q Okay. Do you have a memory of the
8 A No, I did not.	8 creative process whereby you decided on "banner" as
9 Q Who did?	9 a command?
10 A I don't know. 17:51:07	10 A I don't remember the details. 17:54:21
11 Q Did you coin the term "banner" as an	11 (Exhibit 42 was marked for identification
12 operating system command?	12 and is attached hereto.)
13 MR. NEUKOM: Objection. Vague.	13 BY MR. FERRALL:
14 THE WITNESS: I simply implemented the	14 Q We've marked as Exhibit 42 another excerpt
15 command. 17:51:37	15 of code that we've reformatted. It bears control 17:54:43
16 BY MR. FERRALL:	16 numbers CSI-CLI-01108326.
17 Q Are you aware of operating systems in	17 MR. NEUKOM: Counsel, I take it this is a
18 existence before you joined Cisco that used the	18 printout of a file or a document that was produced
19 command "banner"?	19 with an AEO designation.
20 A I don't recall any at this point. 17:51:52	20 MR. FERRALL: Right. 17:55:02
21 Q When did you come up with the command	21 MR. NEUKOM: Okay. So we're going to mark
22 "banner MOTD"?	22 the witness's copy and we'll ask that all copies in
23 A The command that came first was just	23 the room be marked by hand with the phrase "Highly
24 "banner," and its function was to print a vacant	24 Confidential - AEO."
25 terminal message on a terminal and to apply some 17:52:26	25 /// 17:55:10
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1 BY MR. FERRALL: 17:55:19	1 interior routing protocols. And customer networks, 17:59:19
2 Q Mr. Lougheed, this is a document that	2 especially in the early days when they were attached
3 appears to be your work, according to the copyright	3 to the -- they had campus networks running one
4 notice on the front.	4 routing protocol, they'd be attached to the NSFNET
5 Do you see that? 17:55:29	5 backbone as well running a different routing 17:59:39
6 A Yes, I see that.	6 protocol.
7 Q Okay. Do you know when -- do you	7 And since routing protocols would give
8 recognize it?	8 incommensurate metrics, metrics that could not be
9 A Yes, I do.	9 compared, I developed a concept of distance that
10 Q What is it? 17:55:36	10 says if one routing protocol says it knows a route 18:00:08
11 [REDACTED]	11 to one destination and another routing protocol says
12 [REDACTED]	12 it knows a route to that same destination, which --
13 [REDACTED]	13 the routing protocol with the smallest
14 Q And when did you compose what's	14 administrative distance would be the one that would
15 Exhibit 42? 17:56:02	15 be entered into the routing table. 18:00:24
16 A Is there a question?	16 And so that was the problem, and my
17 Q Yes. I asked when did you compose	17 solution was the administrative distance mechanism
18 Exhibit 42?	18 that I described.
19 A Apparently June of 1985.	19 And when I implemented BGP, that was a
20 Q And you were employed by Stanford at that 17:56:28	20 natural extension to include for BGP as well to be 18:00:49
21 time, right?	21 able to configure an administrative distance to
22 A Correct.	22 determine the believability of BGP.
23 Q We had talked earlier about the ARP,	23 If no routing protocol -- if only one
24 address resolution protocol.	24 routing protocol knew the destination, you would
25 Do you remember that? 17:56:57	25 believe that. If there are two or more, 18:01:10
Page 178	Page 180
1 A Yes. 17:56:58	1 administrative distance was the tie-breaker. 18:01:16
2 Q Okay.	2 Q Sorry. I'm going to jump back to ARP.
3 A I remember you asked questions about that.	3 There's a term you use associated with
4 Q Are you familiar with there being a	4 ARP, "ARP cache." We talked about that earlier in
5 provision for time-outs in the ARP protocol? 17:57:15	5 looking at one of the "clear" commands, right? 18:01:52
6 MR. NEUKOM: Objection. Vague and	6 Where did the term "ARP cache" come from?
7 compound.	7 A The cache is a -- logically a list of
8 THE WITNESS: There is the -- ARP entries	8 items. An ARP cache would be a list of ARP requests
9 can become stale. If you unplug the computer or you	9 that have been satisfied, including their MAC
10 move the computer somewhere else or you replace the 17:57:43	10 addresses and how long since the last time we'd seen 18:02:37
11 network interface, entries will become stale.	11 a -- the router had seen an ARP request go by for
12 Implementing a time-out is a way of making sure the	12 that particular source address.
13 cache isn't stale.	13 That sort of computer science concept of a
14 BY MR. FERRALL:	14 cache is found all over.
15 Q Are you aware of there being a provision 17:58:10	15 Q One of the commands that is indicated that 18:03:14
16 for time-outs in the RFC for ARP?	16 you authored is the command "boot system."
17 MR. NEUKOM: Objection. Vague and	17 Had you ever heard someone use the words
18 compound, asked and answered.	18 "boot system" together before you joined Cisco?
19 THE WITNESS: I'm not -- I don't remember	19 MR. NEUKOM: Objection. Vague.
20 such language right now. 17:58:38	20 THE WITNESS: I had heard phrases like 18:03:45
21 BY MR. FERRALL:	21 "boot the system up," "reboot the system," "reload
22 Q Did you create the term "distance BGP"?	22 the system," "start the system," "restart the
23 A Yes.	23 system."
24 Q How did you come up with that term?	24 (Exhibit 43 was marked for identification
25 A The Cisco IOS started supporting multiple 17:59:11	25 and is attached hereto.) 16:48:10
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<p>1 BY MR. FERRALL: 18:04:06</p> <p>2 Q We've marked as Exhibit 43 a document</p> <p>3 entitled "DECbrouter 90 Products Configuration and</p> <p>4 Reference Volume 2." It bears control numbers</p> <p>5 CSI-ANI-00081683 to 81683.000344. 18:04:25</p> <p>6 Have you ever seen Exhibit 43 before?</p> <p>7 A No.</p> <p>8 Q According to the metadata of this</p> <p>9 document, you are the custodian.</p> <p>10 Do you have any idea why that's the case? 18:05:03</p> <p>11 A No, I don't. I haven't seen it before.</p> <p>12 Q Let me turn to another question.</p> <p>13 Were you -- have you ever tracked the</p> <p>14 extent to which other companies have used Cisco CLI</p> <p>15 commands? 18:05:45</p> <p>16 A No, I have not.</p> <p>17 Q Are you aware of other companies using</p> <p>18 Cisco CLI commands?</p> <p>19 A I'm aware of Arista using Cisco CLI</p> <p>20 commands. 18:06:07</p> <p>21 Q Are you aware of any other company using</p> <p>22 Cisco CLI commands?</p> <p>23 A No, I'm not.</p> <p>24 Q When did you first become aware of Arista</p> <p>25 using Cisco CLI commands? 18:06:16</p> <p style="text-align: right;">Page 182</p>	<p>1 A IPv6 address IPv6 route 18:08:37</p> <p>2 Q What was your role in composing IPv6</p> <p>3 address?</p> <p>4 A I was creating a prototype IPv6</p> <p>5 implementation 18:09:03</p> <p>6 Q Did you come up with that command, "IPv6</p> <p>7 address"?</p> <p>8 A Yes</p> <p>9 Q When did you do that?</p> <p>10 A I believe it was 1996 18:09:21</p> <p>11 Q Did you work with anyone else on that?</p> <p>12 A Yes</p> <p>13 Q Who?</p> <p>14 A Dino Farinacci and Rand Atkinson, and</p> <p>15 later Pedro Marquez 18:09:42</p> <p>16 Q The other one you said was IPv6 route?</p> <p>17 A That may have been Dino</p> <p>18 MR FERRALL: Let me go off the record for</p> <p>19 a second</p> <p>20 THE VIDEO OPERATOR: Going off the record, 18:10:11</p> <p>21 the time is 6:10 p m</p> <p>22 (Recess, 6:10 p m - 6:11 p m)</p> <p>23 THE VIDEO OPERATOR: Back on the record</p> <p>24 The time is 6:11 p m</p> <p>25 /// 18:11:34</p> <p style="text-align: right;">Page 184</p>
<p>1 A When Cisco announced the -- actually, it 18:06:22</p> <p>2 was in the Mercury News in the morning, and then</p> <p>3 later through internal email at Cisco.</p> <p>4 Q When the suit was filed?</p> <p>5 A When the suit was filed. 18:06:38</p> <p>6 Q Okay. Not before?</p> <p>7 A Not before.</p> <p>8 Q Did you have any involvement in the</p> <p>9 litigation between Cisco and Huawei?</p> <p>10 MR. NEUKOM: That's a "yes" or "no" due to 18:06:49</p> <p>11 privilege concerns.</p> <p>12 THE WITNESS: No, I was not involved with</p> <p>13 Huawei.</p> <p>14 BY MR. FERRALL:</p> <p>15 Q Are you able to -- sorry. Strike that. 18:07:26</p> <p>16 Were you involved at all in composing any</p> <p>17 of the commands that begin with "AAA"?</p> <p>18 A No.</p> <p>19 Q Can you tell me how the "clock set"</p> <p>20 command was composed? 18:08:07</p> <p>21 A No, I cannot. I wasn't involved.</p> <p>22 Q Can you tell me how any of the IPv6</p> <p>23 commands were composed?</p> <p>24 A Yes.</p> <p>25 Q Which ones? 18:08:30</p> <p style="text-align: right;">Page 183</p>	<p>1 BY MR. FERRALL: 18:11:36</p> <p>2 Q Did you compose the command "timers basic</p> <p>3 RIP"?</p> <p>4 A I believe I did.</p> <p>5 Q Prior to your joining Cisco, are you 18:11:55</p> <p>6 familiar with any commands that use the word</p> <p>7 "timers"?</p> <p>8 MR. NEUKOM: Objection. Vague.</p> <p>9 THE WITNESS: No, I was not aware of any</p> <p>10 operating system, general purpose or network 18:12:13</p> <p>11 specific, that used -- had a "timers" command.</p> <p>12 BY MR. FERRALL:</p> <p>13 Q How did you come up with the command</p> <p>14 "timers basic RIP"? Describe that creative process</p> <p>15 for me. 18:12:30</p> <p>16 A There developed a need or a desire to</p> <p>17 change some of the fundamental timing constants</p> <p>18 of -- I think first was the IGRP routing protocol,</p> <p>19 and I implemented a command that allowed those</p> <p>20 timers to be user-configured. 18:12:59</p> <p>21 And later on I or someone else extended</p> <p>22 that to the RIP timers so customers could speed up</p> <p>23 or slow down the pulse of routing updates.</p> <p>24 Q And when did that occur?</p> <p>25 A 1988 or 1989. 18:13:36</p> <p style="text-align: right;">Page 185</p>

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1 Q How did you choose the term -- the words 18:13:39	1
2 "timers basic" for this function?	2
3 A I don't remember where "basic" came from.	3
4 But using the keyword "timers" was my -- was my	4
5 introduction, was my creation. 18:14:00	5
6 MR. NEUKOM: Counsel, I believe we're now	6
7 beyond seven hours.	7
8 MR. FERRALL: Okay. Well, I -- given	8 I, KIRK LOUGHEED, do hereby declare under
9 Mr. Lougheed's tenure at Cisco, I thank him for his	9 penalty of perjury that I have read the foregoing
10 time, but I will say I think we deserve some more 18:14:22	10 transcript; that I have made any corrections as
11 time with him.	11 appear noted, in ink, initialed by me, or attached
12 But I understand seven hours is up and	12 hereto; that my testimony as contained herein, as
13 you're going to say enough is enough for today I	13 corrected, is true and correct.
14 take it; is that right?	14 EXECUTED this ____ day of _____,
15 MR. NEUKOM: Certainly for today for the 18:14:31	15 2015, at _____,
16 sake of the witness. And we will respectfully	16 (City) (State)
17 disagree with the idea that counsel needs more than	17
18 seven hours --	18
19 MR. FERRALL: Okay.	19
20 MR. NEUKOM: -- needs more than today. 18:14:41	20 KIRK LOUGHEED
21 But we can discuss that for another day.	21
22 In the meantime, I should note for the	22
23 record the witness reserves the right to review the	23
24 transcript and make corrections.	24
25 Brian, I'm not sure I did that for 18:14:51	25
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1 Mr. Tjong. If you're okay with it, I'd like to just 18:14:53	1 I, the undersigned, a Certified Shorthand
2 do a stipulation across the case that both sides	2 Reporter of the State of California, do hereby
3 have the 30-day review and errata right for all	3 certify:
4 transcripts regardless whether counsel puts it on	4 That the foregoing proceedings were taken
5 the record at the depo as a two-way street. 18:15:04	5 before me at the time and place herein set forth;
6 MR. FERRALL: That's fine. I thought it	6 that any witnesses in the foregoing proceedings,
7 existed as a matter of procedure anyway. So that's	7 prior to testifying, were administered an oath; that
8 fine.	8 a record of the proceedings was made by me using
9 MR. NEUKOM: I hope you're right, but glad	9 machine shorthand which was thereafter transcribed
10 to have the stipulation, even if it's unnecessary. 18:15:17	10 under my direction; that the foregoing transcript is
11 MR. FERRALL: Okay.	11 a true record of the testimony given.
12 MR. NEUKOM: Thanks very much.	12 Further, that if the foregoing pertains to
13 THE VIDEO OPERATOR: This concludes	13 the original transcript of a deposition in a Federal
14 today's videotaped deposition of Mr. Kirk Lougheed.	14 Case, before completion of the proceedings, review
15 We're off the record at 6:15 p.m. Thank you. 18:15:25	15 of the transcript [X] was [] was not requested.
16 (TIME NOTED: 6:15 p.m.)	16 I further certify I am neither financially
17 --o0o--	17 interested in the action nor a relative or employee
18	18 of any attorney or any party to this action.
19	19 IN WITNESS WHEREOF, I have this date
20	20 subscribed my name.
21	21
22	22 Dated: 11/25/2015
23	23
24	24 <i>Carla Soares</i>
25	25 CARLA SOARES
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